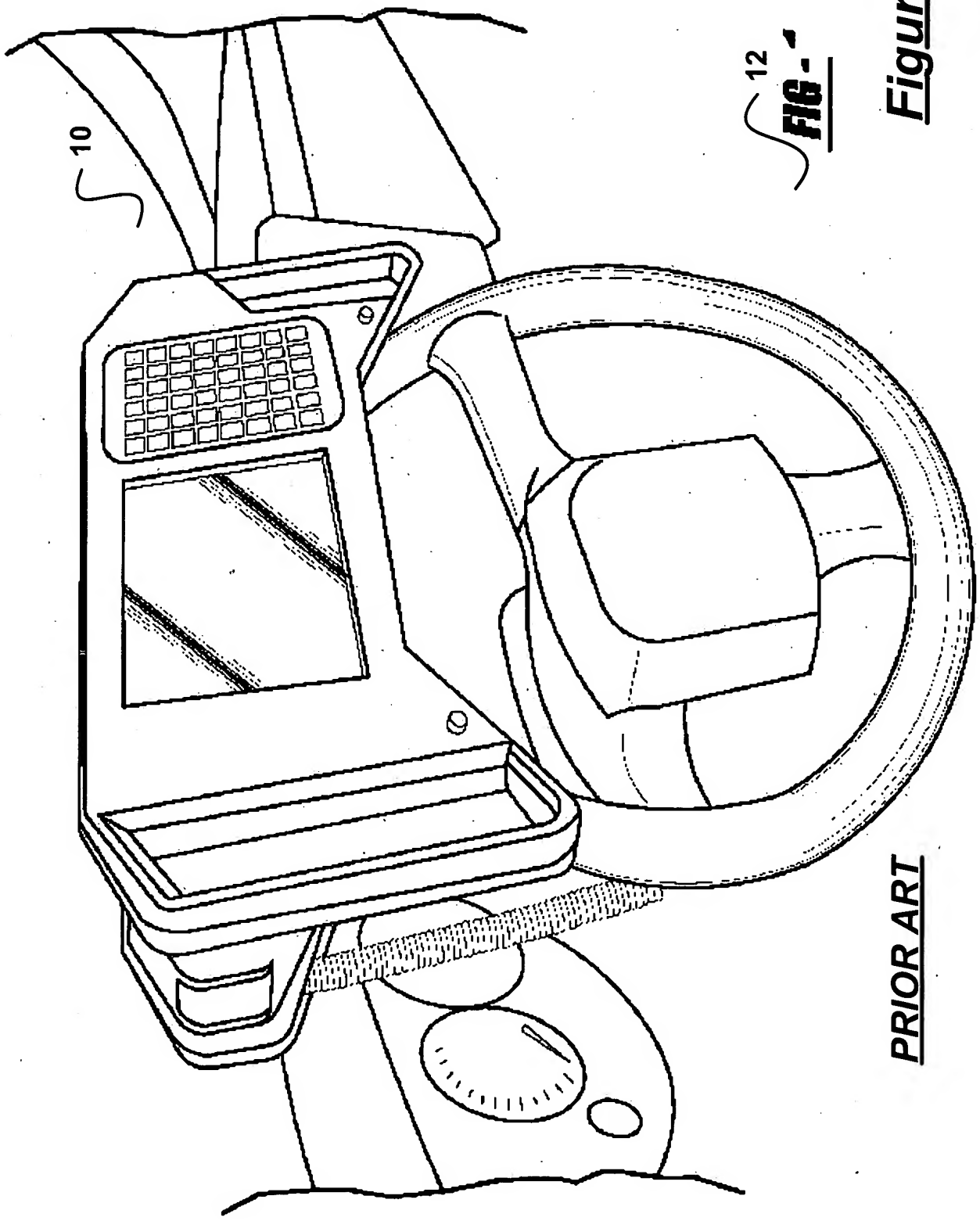


FIG. 1

Figure - 1

PRIOR ART

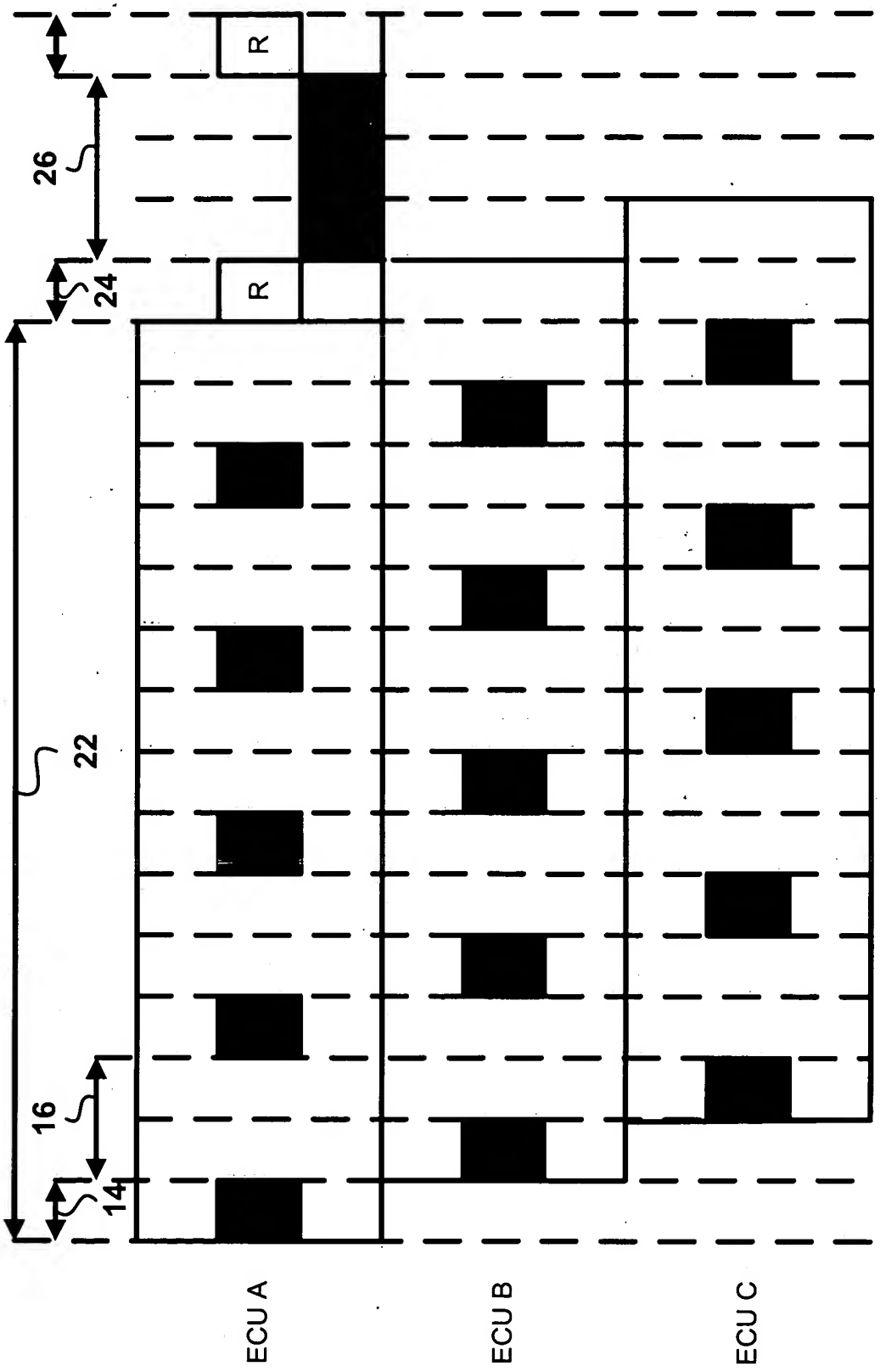
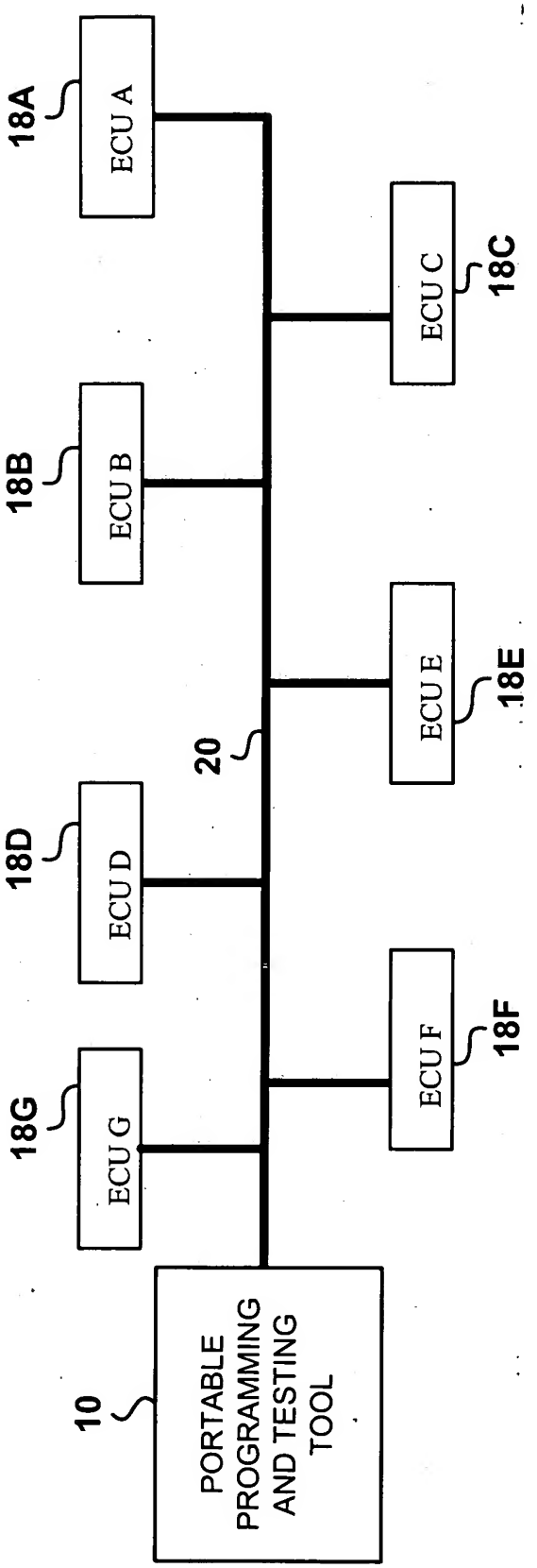


Figure - 2



PRIOR ART

Figure - 3

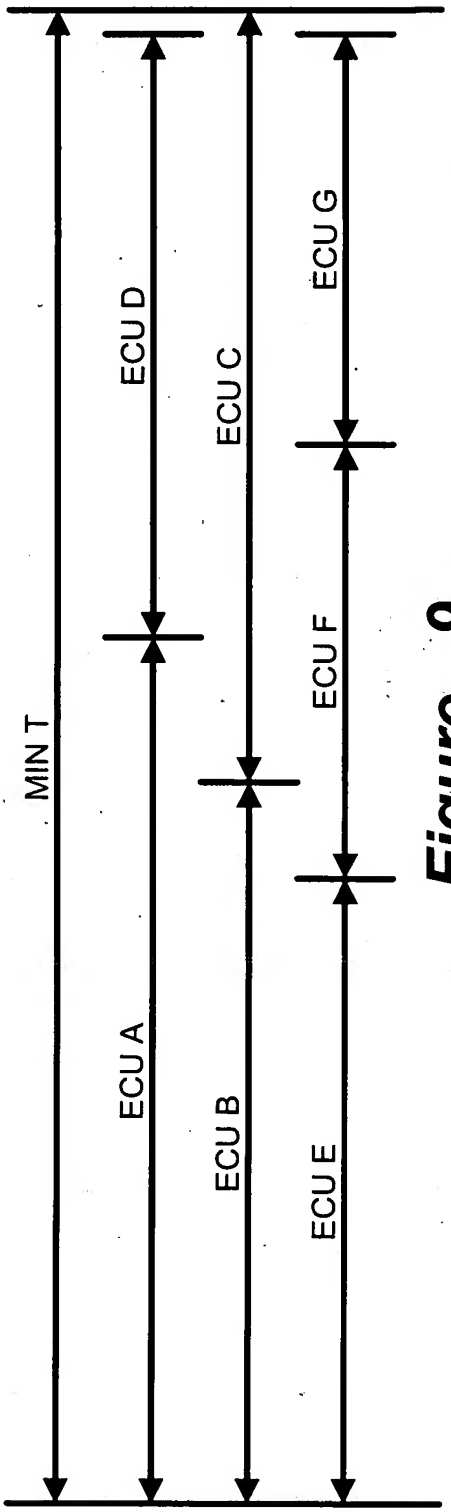


Figure - 9

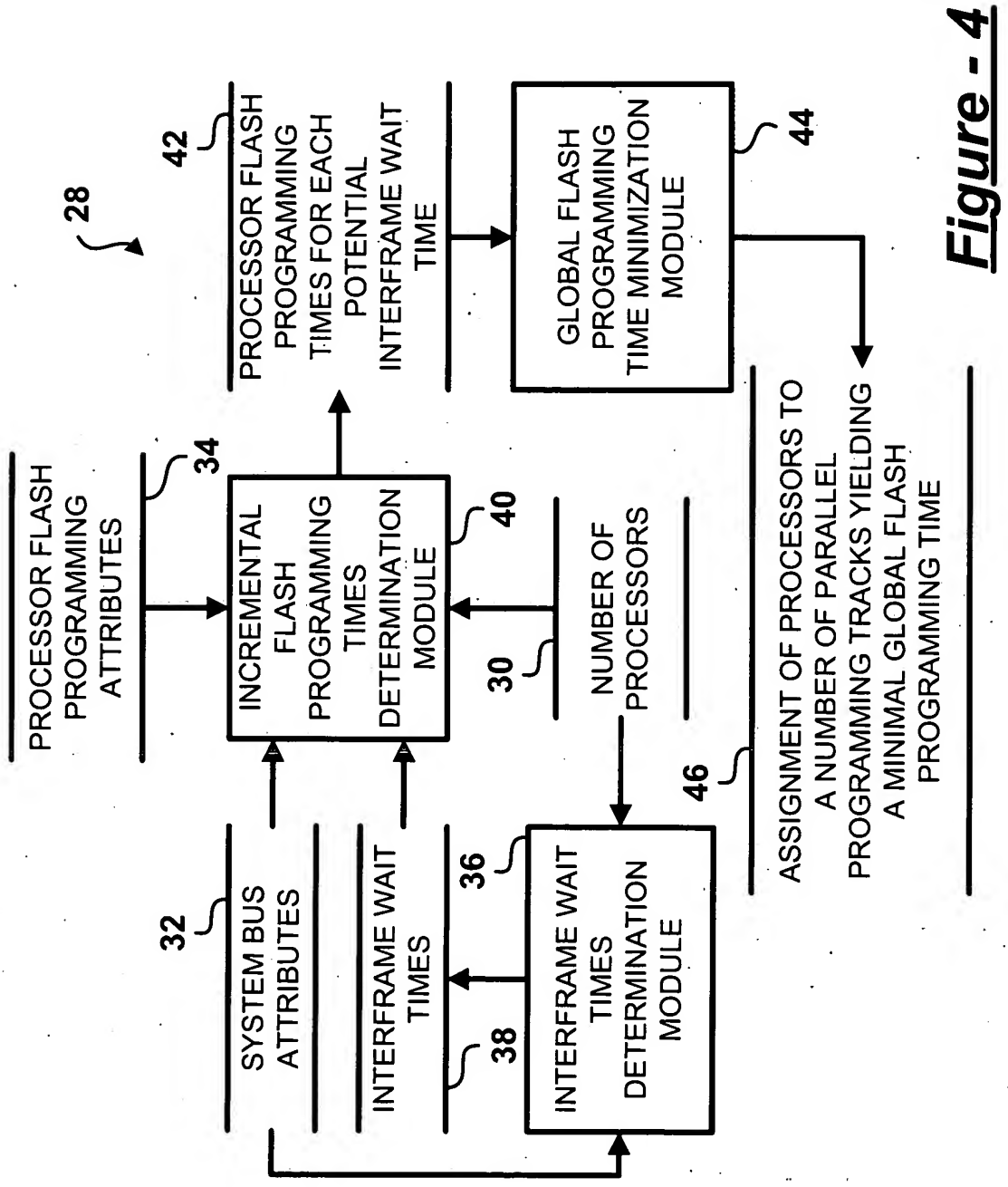

28
42
PROCESSOR FLASH PROGRAMMING TIMES FOR EACH POTENTIAL INTERFRAME WAIT TIME
GLOBAL FLASH PROGRAMMING TIME MINIMIZATION MODULE
44
PROCESSOR FLASH PROGRAMMING ATTRIBUTES
34
INCREMENTAL FLASH PROGRAMMING TIMES DETERMINATION MODULE
40
30
NUMBER OF PROCESSORS
46
ASSIGNMENT OF PROCESSORS TO A NUMBER OF PARALLEL PROGRAMMING TRACKS YIELDING A MINIMAL GLOBAL FLASH PROGRAMMING TIME
32
SYSTEM BUS ATTRIBUTES
INTERFRAME WAIT TIMES
36
38
INTERFRAME WAIT TIMES DETERMINATION MODULE

Figure - 4

Title: METHOD FOR OPTIMIZING ECU PARALLEL FLASH PROGRAMMING ARRANGEMENT ON A CAN-BASED VEHICLE SERIAL BUS IN GENERAL ASSEMBLY
Inventor(s): Jianying Shi et al
Atty. Ref.: GP-303625 (HDP: 8540R-000052)

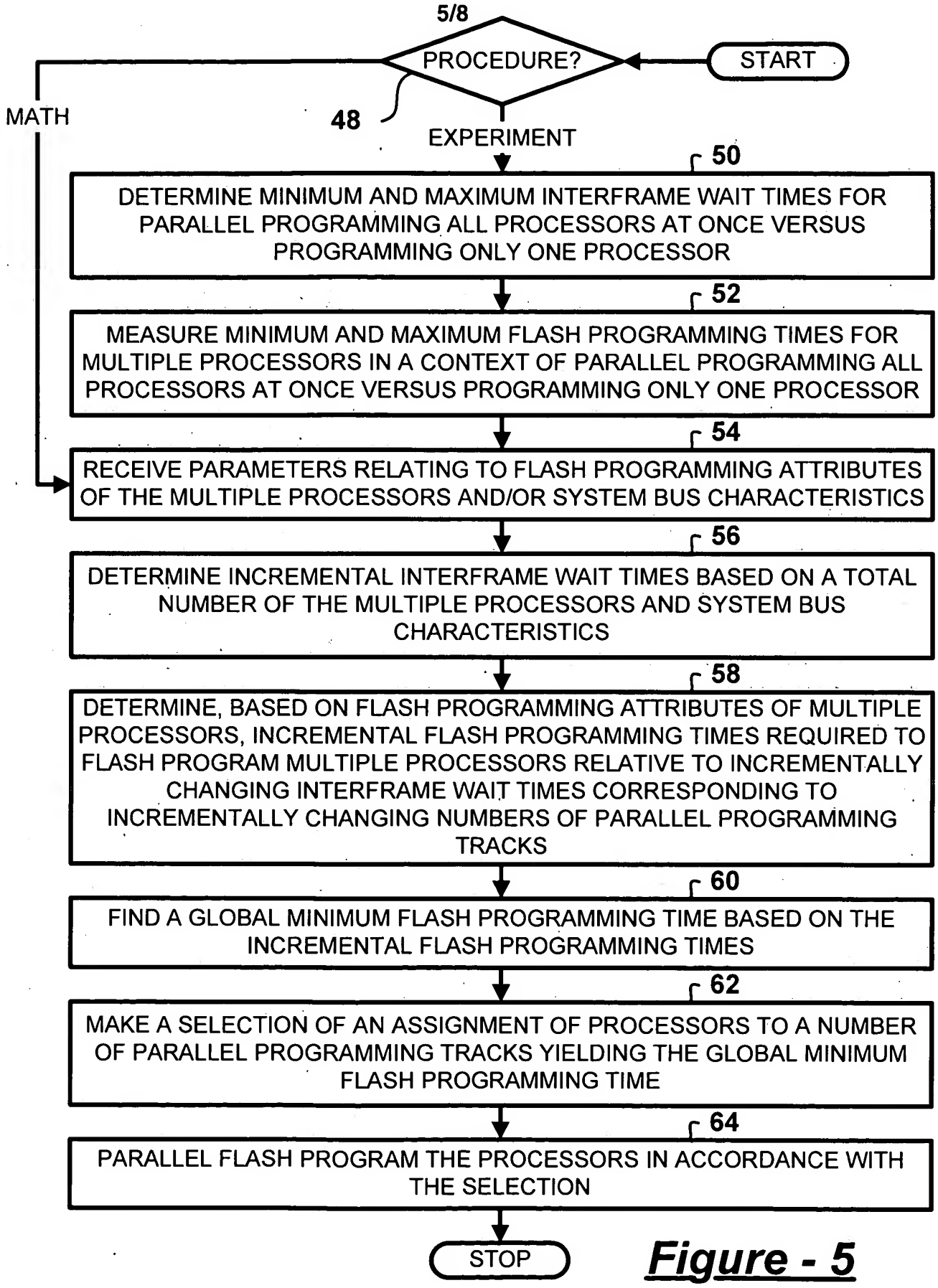


Figure - 5

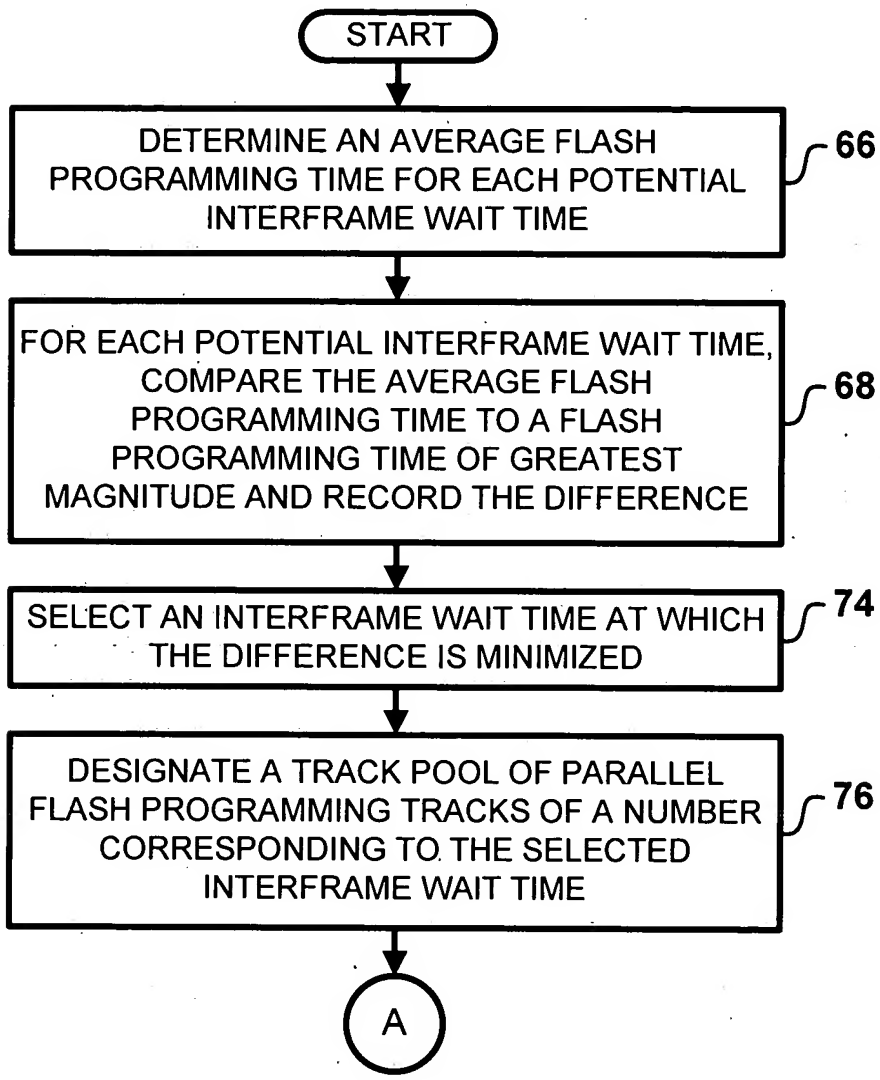

START
DETERMINE AN AVERAGE FLASH PROGRAMMING TIME FOR EACH POTENTIAL INTERFRAME WAIT TIME
66
FOR EACH POTENTIAL INTERFRAME WAIT TIME, COMPARE THE AVERAGE FLASH PROGRAMMING TIME TO A FLASH PROGRAMMING TIME OF GREATEST MAGNITUDE AND RECORD THE DIFFERENCE
68
SELECT AN INTERFRAME WAIT TIME AT WHICH THE DIFFERENCE IS MINIMIZED
74
DESIGNATE A TRACK POOL OF PARALLEL FLASH PROGRAMMING TRACKS OF A NUMBER CORRESPONDING TO THE SELECTED INTERFRAME WAIT TIME
76
A

Figure - 6

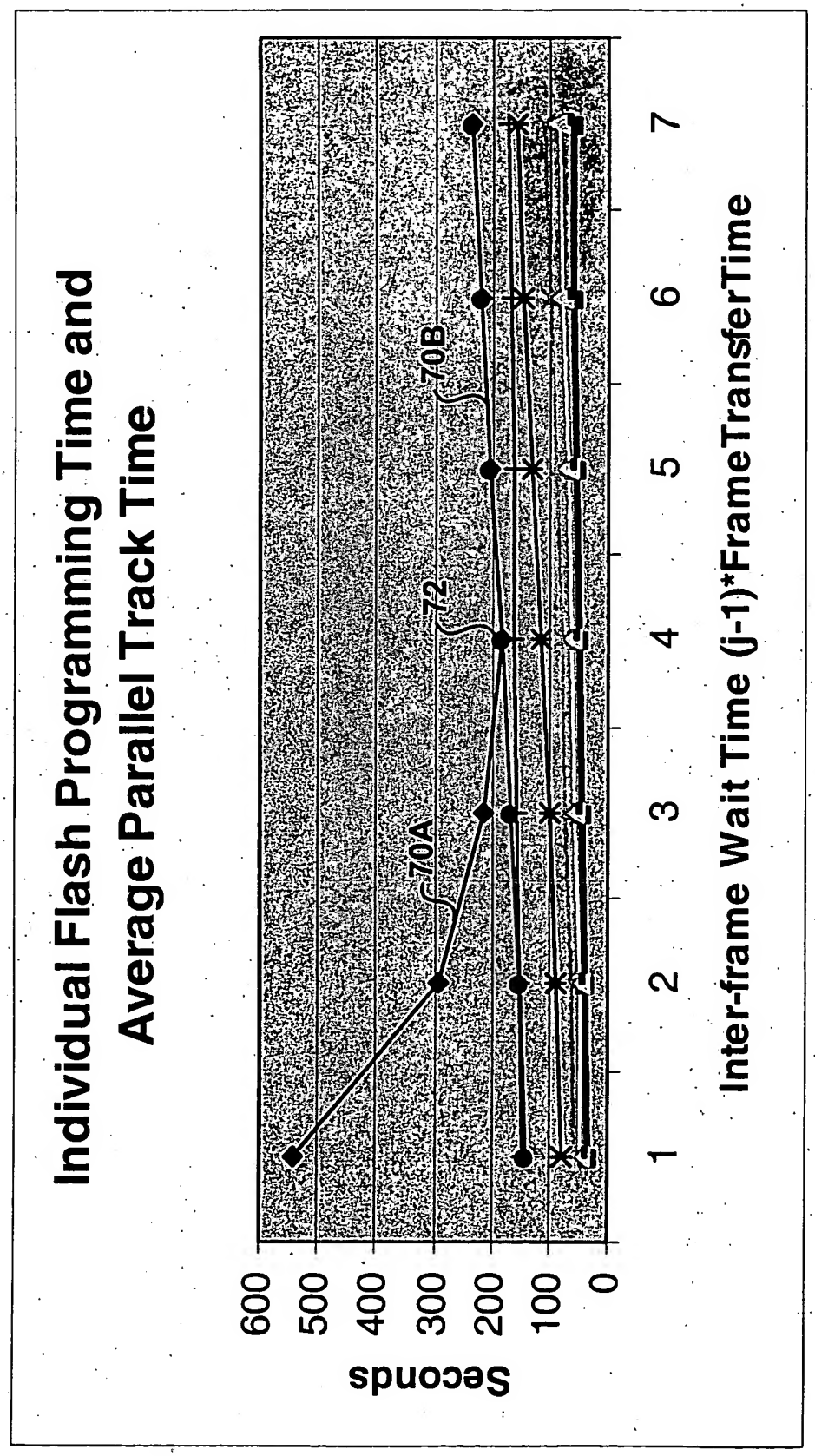

Individual Flash Programming Time and
Average Parallel Track Time
Seconds
600
500
400
300
200
100
0
1
2
3
4
5
6
7
Inter-frame Wait Time (j-1)*FrameTransferTime
70A
72
70B

Figure - 7

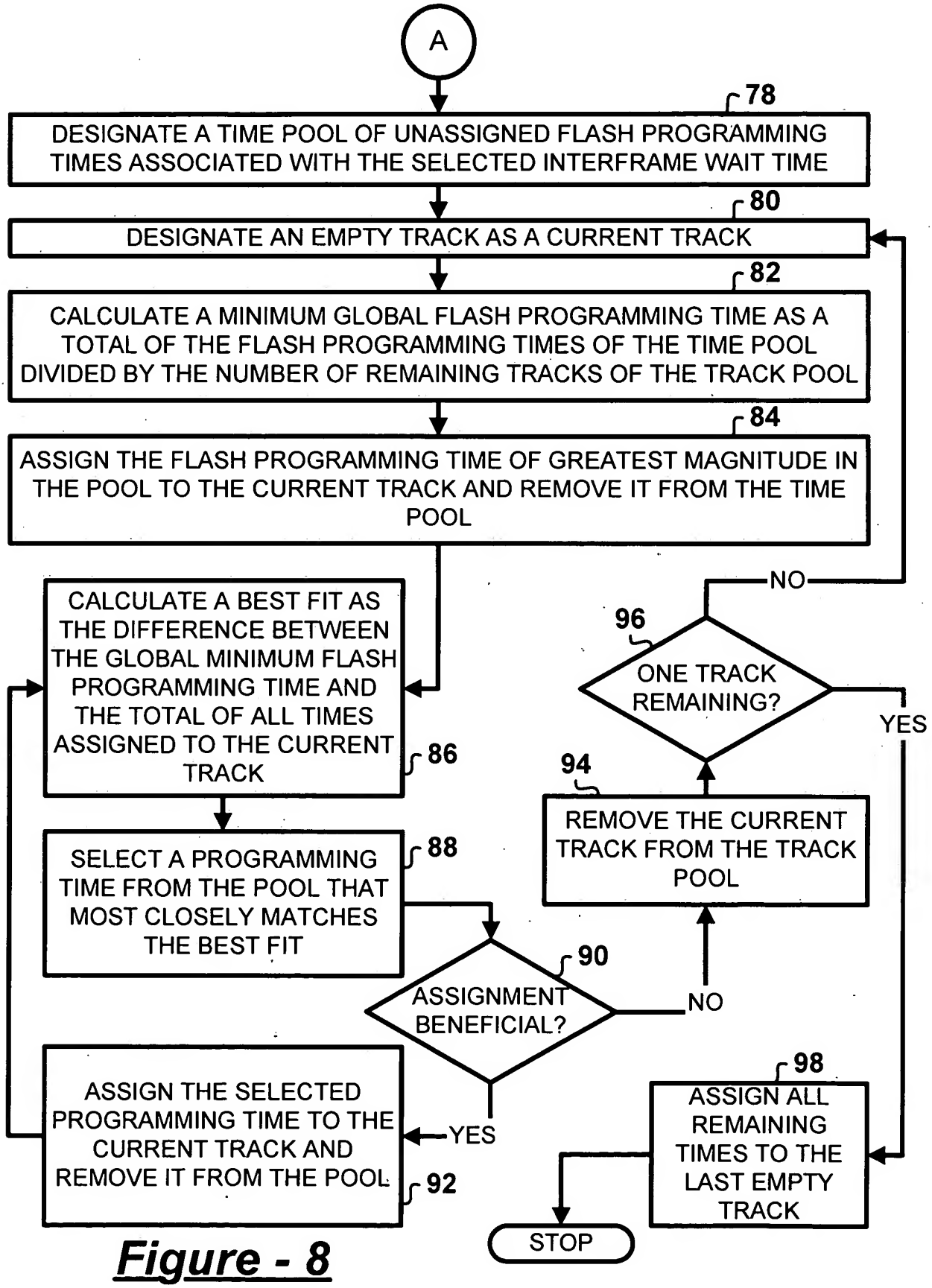

A
78
DESIGNATE A TIME POOL OF UNASSIGNED FLASH PROGRAMMING TIMES ASSOCIATED WITH THE SELECTED INTERFRAME WAIT TIME
80
DESIGNATE AN EMPTY TRACK AS A CURRENT TRACK
82
CALCULATE A MINIMUM GLOBAL FLASH PROGRAMMING TIME AS A TOTAL OF THE FLASH PROGRAMMING TIMES OF THE TIME POOL DIVIDED BY THE NUMBER OF REMAINING TRACKS OF THE TRACK POOL
84
ASSIGN THE FLASH PROGRAMMING TIME OF GREATEST MAGNITUDE IN THE POOL TO THE CURRENT TRACK AND REMOVE IT FROM THE TIME POOL
CALCULATE A BEST FIT AS THE DIFFERENCE BETWEEN THE GLOBAL MINIMUM FLASH PROGRAMMING TIME AND THE TOTAL OF ALL TIMES ASSIGNED TO THE CURRENT TRACK
86
SELECT A PROGRAMMING TIME FROM THE POOL THAT MOST CLOSELY MATCHES THE BEST FIT
88
90
ASSIGNMENT BENEFICIAL?
NO
YES
ASSIGN THE SELECTED PROGRAMMING TIME TO THE CURRENT TRACK AND REMOVE IT FROM THE POOL
92
96
ONE TRACK REMAINING?
NO
YES
94
REMOVE THE CURRENT TRACK FROM THE TRACK POOL
98
ASSIGN ALL REMAINING TIMES TO THE LAST EMPTY TRACK
STOP

Figure - 8